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Effects of atmospheric cold plasma on microbial growth of *Listeria innocua* and *Staphylococcus aureus* in ready-to-eat fish products

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Abstract

Food-borne pathogens, including *Staphylococcus aureus* and *Listeria monocytogenes*, in fish products account for death to a great extent. To increase shelf-life of foods and also preserve their sensory properties, plasma treatments have attracted more attention. The present study was intended to investigate the efficacy of atmospheric cold plasma (ACP) using argon and helium gas flows for ready-to-eat (RTE) fish products contaminated with *L. innocua* and *S. aureus* at short treatment durations of 4, 6 and 10 min. The results showed that argon plasma at each time point (4, 6, and 10 min) had a significantly inhibitory effect on the growth of *L. innocua*. Also, it reduced over a 10-minute treatment with helium plasma. There was a direct correlation between exposure time and antimicrobial efficiency of argon and helium ACP. The survival of *S. aureus* decreased by 0.19-1.04 Log cycles after argon plasma whereas helium plasma had a lower potential for growth reduction within the range of 0.03 and 0.55 Log cycles. It could be concluded that ACP is effective for lowering growth of different micro-organisms on RTE fish samples. *L. innouca* was considerably more sensitive than *S. aureus* to atmospheric pressure plasma (APP).

Keywords: Cold plasma, Argon, Helium, Microbial viability, Fish products

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